4: POINT-TO-POINT ANALOG/DIGITAL

All terrestrial - No earth- space. Power could be limited to 100 W PEP (NOT ERP!)

Total spectrum required is 24 MHz between 2,200 and 2,450 MHz. This must be in a minimum of two segments spaced by a minimum of 40 MHz and less than 170 MHz. This can be done in several smaller segments, but the minimum useful size of a segment is 1.6 MHz (effectively 2 MHz) These segments must pair within the spacing above, but need not be either adjacent nor of identical spacing. These frequencies can adjoin either or both the weak signal or satellite segments but cannot include these segments

The smaller the segments are, the less efficiently we can use them. If we must settle for several small segments, the total must be the full 24 MHz, otherwise we will essentially have nothing to work with after the first few systems are accommodated.

A power restriction to 100 watts PEP (NOT ERP!) would be acceptable, if needed, to facilitate sharing with Government operations.

5: POINT-TO-POINT TV

Terrestrial only- no earth/space. Power could be restricted to 100 W PEP (NOT ERP)

Total spectrum required is 60 MHz between 2200 and 2450 in 3 20 MHz blocks ("channels"), one separated by a minimum of 50 MHz from the other two. Having all three channels spaced out would be nice, but less spectrum efficient (two channels would fit in 35 MHz if adjacent, rather than 40) as explained above. If all of 2417 to 2450 is available for TV and not used by Satellite, two of the needed channels could fit in this space, provided that none of the analog point to point systems have to be sandwiched into the same space.

SCRRBA

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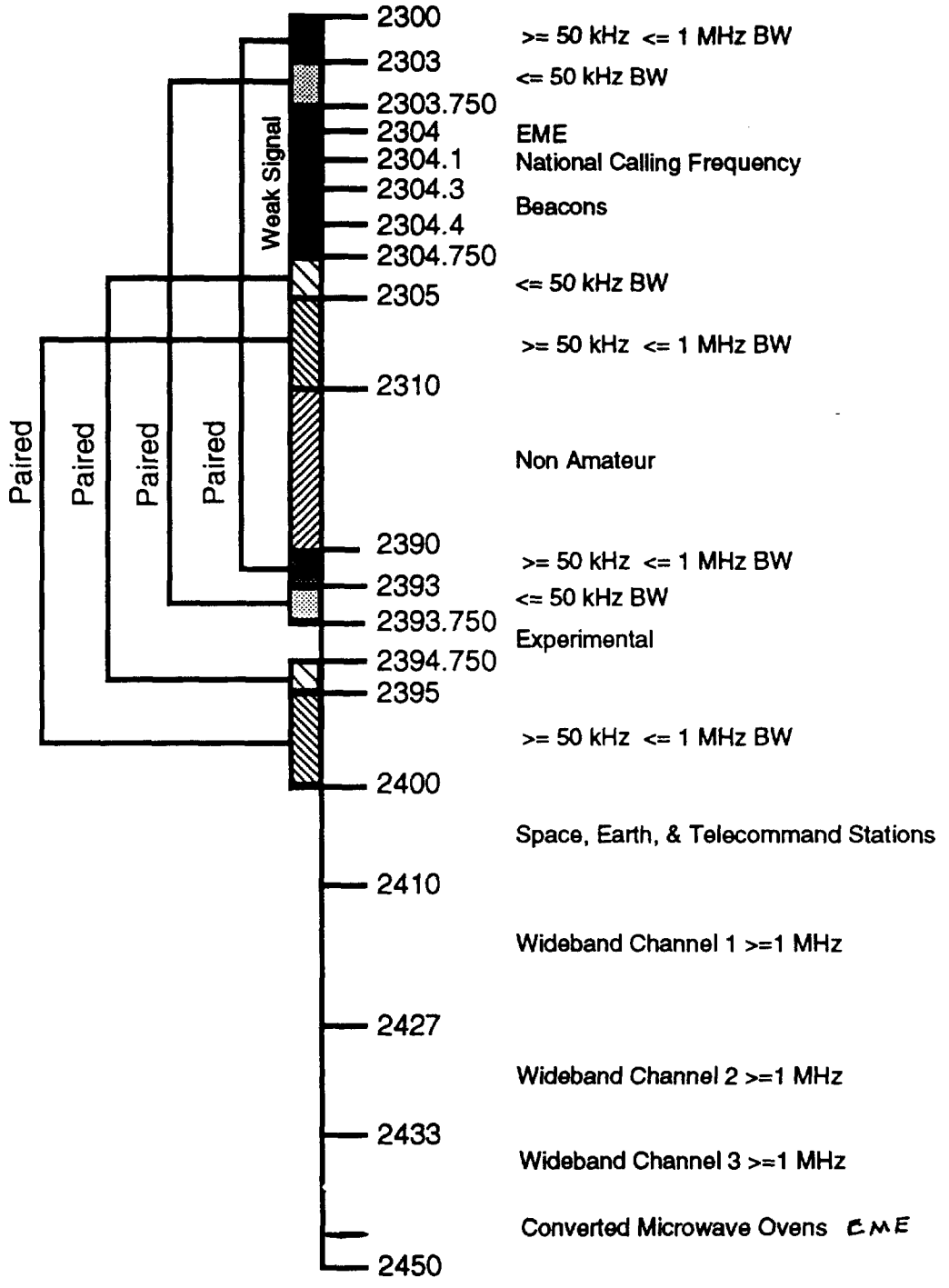

2300-2450 MHz Band Plan
Adopted 9-26-92
SCRRBA

SCRRBA

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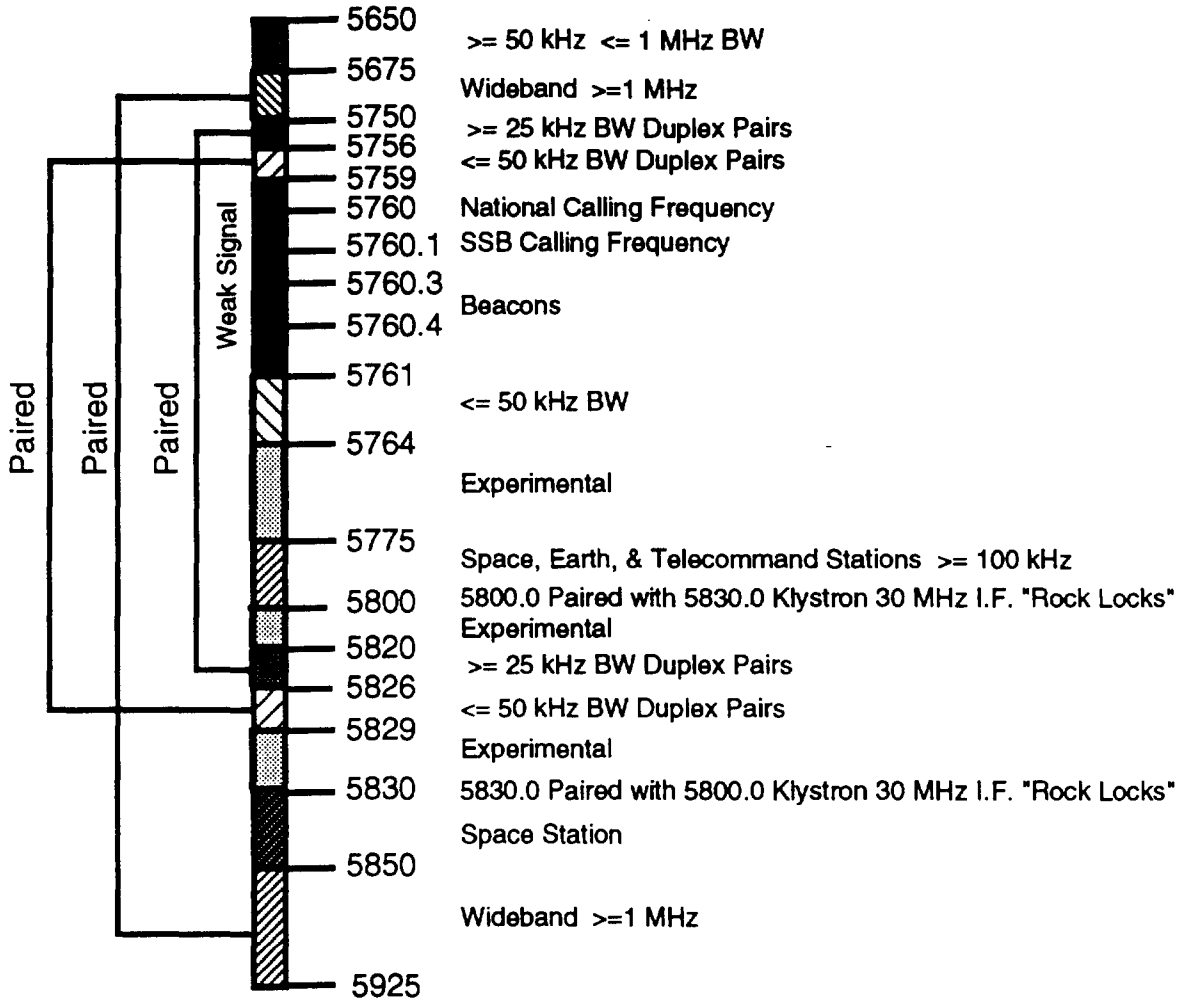
Pasadena, California 91117



5650-5925 MHz Band Plan
Adopted 9-26-92
SCRRBA

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In the Matter Of:	)	
	)	
Spectrum reallocation in the 2.30	)	**ET Docket No. 94-32**
through 2.45 GHz Frequency bands	)	
Of spectrum transferred from	)	
Federal Government Use	)	

Re: Reply comments of the Southern California Repeater and Remote Base Association.

June 29, 1994

The Southern California Repeater and Remote Base Association (SCRRBA) has filed timely comments in the matter of the NOI 94-32. We hereby file reply comments to several of the comments received by the FCC in this matter.

We have reviewed the more than 70 comments received by the FCC. Just under half of the total list of commenters state support for the Coalition of Private Users of Emerging Multimedia Technologies (COPE) Petition for Rulemaking (filed December 23, 1993). Of these commenters, the vast majority simply state their support for the COPE petition and do not add any substantive information to this proceeding. Several commenters supporting the COPE petition do make substantive and significant comments. We reply to some of these in this document. Of the remaining commenters, just under half are from the Amateur community. Most of these comments are from major organizations, frequency coordination councils, and large groups with substantial direct interests in the 2,300 MHz band. Most of these comments provide specific information on amateur operations, specific and general comments on the amateur-commercial spectrum sharing, and specific and general suggestions to alleviate the problem. The remaining significant comments are from the Part 15 community, the Mobile Satellite interests, and the "Telephone Company" category services.

All of the (non-amateur) commenters who mention Amateur radio activity imply that amateur-commercial spectrum sharing will not actually happen. The commenters who actually evaluate the matter conclude that such spectrum sharing would be "difficult." These commenters write in a way that implies that the FCC will remove amateur operations from "their" portion of the band. This "Fait Accompli" cannot be allowed to happen without proper and reasonable replacement spectrum being supplied to the amateur community.

The Telecommunications Industry Association (TIA) writing in its comments on the NOI, and on the NTIA preliminary report, accurately states: "sharing with the amateur service would be difficult". TIA is writing from the position of support of Private Licensed Commercial communications systems. TIA notes that "no definitive analysis is revealed to substantiate..." the NTIA claim that the Amateur community can satisfy its spectrum needs in the renaming 35 MHz. We agree. Our comments, those of the ARRL, RASC (Radio Amateur Satellite Corp.), NARC (Northern Amateur Relay Council), SBMS (San Bernardino Microwave Society), and the other Amateur commenters support the amateur position contrary to that of the NTIA. TIA's conclusions are reasonable, both with respect to the amateur community and to the Part 15 and ISM use of 2400-2483.5 MHz.[1]

NABER (National Association of Business and Educational Radio) draws similar conclusions to those of the TIA[2]. However, NABER concludes that some sharing with the amateur service could be accomplished in the 2,390-2,400 MHz segment. NABER suggests this could be accomplished through "exclusive" licensing and "grandfathering." We are unable to see how this could be done as amateurs are not licensed to a specific location or frequency. Processing a request for a commercial license through an amateur frequency coordination council is the only apparent mechanism available. This would require major (but desirable) rule changes in the amateur service to formalize the existence and authority of amateur frequency coordination councils. Should such a situation come to pass, it is immediately apparent that the commercial entities would be able to license and occupy all the available spectrum without consideration of the slower growth rate of similar amateur systems.

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[1] **TIA comments, pages 6-13, and to the NTIA preliminary report, pages 7-12.**
[2] **NABER comments, page 15**

The American Association of State Highway and Transportation Officials (AASHTO) writes in support of COPE and the IVHS system. They state the ".. two MHz at 2,400-2,402 MHz is sufficient ... to avoid disruption of amateur licensees and is sufficient for amateur satellite services.."[3]. No support or analysis is given for this arbitrary statement. All the amateur comments specifically show why this is not true. See our comments and those of the ARRL and RASC for considerable detail.

COPE states that they have "insufficient information to address the impact (of their proposed activities) on amateur operations." [4] While this honesty is refreshing, it does not serve the problem. It is increasingly clear that the NTIA failed to obtain sufficient information on amateur operations to pass to all the entities proposing activities in the "reallocated" spectrum. It is also clear that little effort to obtain this information independently has occurred in this NOI proceeding. Our comments and those of the ARRL address this shortcoming in detail. The substantial lack of comments on these specific items in the NOI, the comments of COPE, and others, merely reinforces our conclusion: In any shared environment, the amateur is considered unimportant and can be ignored. We hope that the entities who believe this have read and understood the amateur comments to the NTIA and to this NOI proceeding, and have learned from them.

The National Communications System (NCS) comments on amateur activities[5] are correct, but they draw an incorrect conclusion. "The reallocated frequencies should continue to be available on a secondary basis to whatever non-federal service the FCC assigns.." Allocation on a primary basis is the only protection the amateur service has from being completely forced out of the band by the new users.[6]

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[3] **AASHTO comments page 4**
[4] **COPE comments page 7**
[5] **NCS comments, pages 2-3**
[6] **SCRRBA comments page 11**

AT&T writes in favor of retaining Part 15 operations (and avoidance of licensed operations) in the 2,400-2483.5 MHz spectrum. While we support this general conclusion, we do not agree that amateur operations are not generally co-located with Part 15 devices.[7] Quite the contrary, most amateurs live and operate in the immediate proximity of Part 15 devices. AT&T implies that "local area networks (LAN)" might not be co-located with amateur operations. This is not a reasonable conclusion considering the homogenous nature of much of our society. Many people work at home, and many live in homes in the immediate vicinity of office buildings, large and small. The wireless LAN (WAN) is one of the most likely items to be added to a small business or "home office" given our general proclivity for wanting the latest computer gadget. SCRRBA has specific suggestions for Part 15 operations that will be addressed at the end of our comments on other Part 15 items.

GEC Plessey (GEC) writes in support of Part 15 use of 2,400-2,483.5 MHz. GEC suggests that value of 2,390-2,400 MHz is dubious due to the interference from existing Part 15 uses and should be combined with the upper segment.[8] GEC proposes that protection of the amateur 2,400-2,402 MHz segment is "technically not daunting." We see no support for this position. The amateur satellite operations are "weak signal" in nature. Amateurs use high gain antennas which are usually, but not always, pointed above the horizon. This has minimized their susceptibility to interference from the microwave oven. Adding Part 15 devices on the low side of this segment can only lead to more trouble. GEC implies that the radiation standards for Part 15 devices are so high already, that very little filtering is needed to meet the rules. The truth is, should Part 15 devices be authorized on both sides of 2,400-2,402 MHz, that virtually no additional filtering will actually be installed in the Part 15 devices. The fact that amateur satellite operations are at 2400-2402 MHz is no accident. Amateurs chose the edge of the Part 15/ISM band for the initial amateur satellite operations. Part 15 devices are necessarily mass produced as inexpensively as possible. To minimize cost, the devices are designed to center their radiation on the middle portion of the ISM band to allow inexpensive filtering and relatively simple waveform control to reduce the out of band emissions to the required level. These techniques do not allow full power right up to the edge of the band with a sharp cutoff to meet

[7] AT&T comments, pages 2-3, SCRRBA comments, page 8
[8] GEC comments- entirety

the rules. Rather, the radiation from these devices gradually slopes off toward the edge of the band, making the edge the quietest portion of the band. Placing 2,400-2,402 MHz in the middle of the Part 15 band will cause the radiated levels in this segment to increase substantially. This will cause unacceptable harm to Amateur Satellite operations. See the comments of AMSC for more information.

Symbol Technologies writes in support of spread spectrum operations under Part 15 on 2400-2,483.5 MHz. Symbol [9], Western Multiplex Corp.[10], Interdigital Communications Corp.[11], SCRRBA,[12] and others all note the present conflict between an interference susceptible wideband licensed system (Pacific Teletrac) and Part 15 devices (and amateur operations). The clear consensus is that no such interference susceptible systems should be authorized, licensed or otherwise be given any protection for operations in the 2,300-2,483.5 spectrum. It is our position that such systems are inherently spectrum inefficient and should not be given any protection regardless of operating frequency.

All of the commenters specifically addressing Part 15 operations do not want licensed operations authorized in the same spectrum. None of these commenters make any request to remove amateur operations from this spectrum.

We are concerned that the wireless "local loop" telephone systems proposed by Southwestern Bell (SBC), Pacific and Nevada Bell, GTE, and others represent an interference susceptible type of digital system similar to the Teletrac system discussed above. (this is not certain, but it is implied by their comments) The request of these commenters to have an exclusive allocation to "eliminate interference" supports this claim. We are most concerned that no such allocation occur. It is very much not in the public interest to support technologies that are sufficiently interference prone to require an exclusive assignment. To use these technologies to support the public switched telephone network, and its outgrowths, is nearly inconceivable. The basic

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[9] **Symbol Technologies comments page 7**
[10] **Western Multiplex comments page 6**
[11] **Interdigital Communications comments, page 4**
[12] **SCRRBA comments page 10 (item b)**

concept put forth by these commenters is quite reasonable and provides opportunities for substantial public benefit. It is incumbent upon the FCC to encourage such new developments while insuring the best use of public spectrum. We urge the FCC to note these items in any final decisions on this spectrum.

SBC claims excessive cost and complexity is required to enable sharing with the amateur service. [13] We feel this is another indication that their proposed system is excessively interference prone. Technical details of their system would be required to determine if this is actually true. We state that certain types of amateur operations would be compatible with a spread spectrum system in the general format of the SBC proposals. Not all amateur operations require high power, nor need occur regularly from residential areas. See discussion below.

We find it interesting that two of the principal commenters[14] from the Mobile Satellite industry cannot agree that their space borne receivers could operate in the presence of Part 15 terrestrial operations. Obviously, they need to perform more research before any decision on MSS placement could occur. This is unfortunate, as the MSS is one of the services we feel has potential to be able to share effectively with certain types of amateur operations. However, it is unlikely that effective sharing could occur with the MSS community, the Part 15 community, and the amateur community simultaneously.

GENERAL CONCLUSIONS

The 2,400-2,450 MHz segment should remain allocated to the Part 15 operations on a secondary basis. No licensed commercial operations should be permitted in this band. The Government secondary (to ISM) allocation at 2,402-2,417 MHz should be replaced with an equivalent allocation for amateur operations. This maintains the Part 15 users as secondary to amateur operations; their present allocation status. The amateur community will choose to place as

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[13] SBC comments, page 9 bottom paragraph.

[14] American Mobile Satellite Corp. comments, page 2 and AMSC NTIA comments, appendix page 3, are opposed to using Part 15 spectrum, and Loral/Qualcomm comments page 5 favor the use of Part 15 spectrum.

much of its interference susceptible operations outside this segment as possible to minimize confrontation with Part 15 users. Just how much will be determined by what spectrum is made available to us. (See closing comments)

The 2,390-2,400 MHz segment would be best allocated to Amateur operations on a primary basis. Absent such a decision, private licensed operations will make the best use of this spectrum. Should the FCC require some form of interference resistant mode of operation (spread spectrum) in this segment, the amateur community might be able to share the use of the spectrum, if the licensed uses are compatible.

SCRRBA has a difficult task communicating the necessary position of the amateur community because we support the basic concept of the Budget act and oppose the implementation of this act on the backs of the amateur community. We, in particular, and the amateur community in general, support the development of more communications services (of all types). We all will benefit directly and indirectly from more and better communications. We are in a unique position to recognize this fact. Many of us are employed in the many forms of the communications industry. We enjoy learning more about communications systems and activities. We enjoy helping others to benefit from this learning and experience. (Why else would we spend long hours of our "leisure" time working so hard on so technical an activity?) We are well aware of the serious need many communications systems users have for more spectrum. We support the basic concept of the Budget act, the COPE petition and many of the commenters of this proceeding regarding the need for more (useful) commercial spectrum. We must strongly oppose the attempt to satisfy portions of this need by functionally destroying amateur operations in the 2,300-2,450 MHz band.

SCRRBA makes several detailed proposals in our comments on this NOI. We further explain possible sharing criterion herein. The key to satisfactory sharing between amateur operations and certain types of commercial operations is having sufficient spectrum available for amateur operations. We detail the types of amateur operations and their general characteristics in the appendix to our comments. There must be spectrum allocated from the 2,200-2,450 MHz band for amateur high power - weak signal operations (Terrestrial, Satellite, and EME), television operations and general experimentation taking place from a residential area. IF such spectrum is made available, and it is adequately separated from the commercial activities to minimize interference, many of the remaining types of amateur operations could take place on a shared spectrum basis.

Amateur point-to point relay systems are generally located on commercial communications sites which provides some physical isolation from general Part 15 users. These systems usually have highly directional antennas, and would likely be able to overcome some interference from Part 15 signals on the same frequencies. Both categories of point to point systems (TV and Message as described in our appendix) could possibly share with Part 15 users. They also could share with portions of the MSS operations, particularly if the MSS downlink system is reasonably resistant to interference. A MSS mobile unit that might stop in the main beam of an amateur point to point link might suffer interference. Such interference to the mobile ground receiver would likely disappear when the mobile unit moved. Similarly, if the MSS mobile uplink is a spread spectrum type, the Amateur point to point system would likely not be bothered. A minor amount of regulation of the antenna specifications on the MSS mobile unit would go a long way to making this work. Requiring a horizon gain of (minus)30 dBi, and a gain at 10 degrees elevation of (minus)15 dBi would tend to virtually eliminate terrestrial signals to and from the MSS unit.

Ideally, of course, it would be best for the amateur operations to be totally separated from any commercial services. We have made a detailed case for amateur-government sharing in the 2,200-2,450 MHz band in our comments to this NOI. The NTIA has stated that we make good sharing partners for the Government. Unfortunately, the NTIA did not see fit to return the 2,310-2,360 MHz spectrum to amateur secondary status when it was determined that it was not needed for Flight Test Telemetry. The present secondary allocation for "DBS" audio space-to-ground does not entirely eliminate the possibility of amateur shared operations in this segment.

The amateur community has shown its willingness to subject itself to unprecedented restrictions to maintain access to portions of this spectrum. (See SCRRBA comments)

Respectfully submitted,

For the SCRRBA Board and Technical Committee

M. Robin Critchell